

Darwin initiative for the survival of species : application for grant for round 9 competition

Please read the accompanying guidance note before completing this form. Give a full answer to each section; applications will be considered on the basis of information submitted on this form. Applicants are asked not to use the form supplied to cross refer to information in separate documents except where this is invited on the form. The space provided indicates the level of detail required but you may provide additional information on a separate sheet if necessary. Copies of this form are available on disk or by e-mail on request. You are asked also to complete the summary sheet attached at the end of this form. Although you may reproduce this sheet in a reasonable font, you should not expand it beyond an A4 sheet (leaving the allocated space for DETR comments to be made) as additional information will not be taken into account.

1. Name and address of organisation

Royal Botanic Garden Edinburgh. 20A Inverleith Row, Edinburgh EH3 2LR

2. Principals in project

Details	Project leader	Other UK personnel (if working more than 50% on project)	Main project partner or co-ordinator in host country
Surname	Gardner		Tai
Forename(s)	Martin		Nguyen Duong
Post held	Co-ordinator, International Conifer Conservation Programme		Director
Institution (if different to the above)			Central Forest Seed Company
Department			
Telephone			
Fax			
Email			

Please provide a one page CV for each of these named individuals.

3. Project title (not exceeding 10 words)

Preservation, rehabilitation and utilisation of Vietnamese montane forests
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4. Abstract of study (in no more than 750 characters)

Viet Nam is among the most biologically diverse countries in the world. However, the forested areas with the highest biodiversity have been destroyed through conflict and overexploitation so that only 28% survive. These are mainly concentrated in the montane areas. Deforestation has also resulted in fluctuations of up to 50% in the annual rice crop through flooding and erosion. The Vietnamese government recognises the difficulty of implementing reforestation and conservation programmes due to the lack of the training and resources. The aim of this project is to provide Vietnamese with knowledge, skills and confidence, which will equip them to contribute positively to the sustainable management of the montane forests.
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5. Timing. Give the proposed starting date and duration of the project.

June 2001 for a duration of three years

6. Describe briefly the aims, activities and achievements of your organisation. (please note that this should describe your unit, institute or department within a university.)

<p>Aims To explore and explain the world of plants.</p>
<p>Activities i) Researching the origins, diversity and relationships of plants, their significance in the environment and their conservation. ii) Communicating the results of scientific research through academic and educational publications. iii) Maintaining collections of living and preserved plants and fungi and botanical literature for research, education and the public's enjoyment. iv) Educating school children, university students and the public in botany and horticulture. v) Promoting plants and plant conservation locally, nationally and internationally.</p>
<p>Achievements i) Arabian plant specialists at RBGE in collaboration with the Royal Botanic Gardens, Kew and Arabian institutions are preparing the Flora of the Arabian Peninsula and Socotra. The flora is the first definitive account of this rich floristic region and will appear in five volumes over ten years. Darwin Initiative funded work on Socotra will produce a user-friendly "ethnoflora" for the non-specialist. ii) RBGE is collaborating with Brazilian scientists in a DFID funded project to conserve the Cerrado region of Central Brazil. The project has identified areas of highest floristic diversity and endemism for future establishment of protected areas. It has also developed sustainable agricultural systems as an alternative to grazing, charcoal production and intensive farming, which have destroyed up to 50% of the Cerrado to date. iii) The International Conifer Conservation Programme (ICCP) has collaborated with Chilean scientists to research the conservation genetics of threatened conifers in the wild and in cultivation. This important area of research, funded by the Darwin Initiative, has led to the restoration of degraded forests in Southern Chile. iv) RBGE scientists are leading a Darwin funded project in the Peruvian Amazon training Peruvian scientists, technicians and students in taxonomy, field collection and identification skills and curation and databasing techniques. The project also aims to promote awareness of Peruvian forest biodiversity issues locally, nationally and internationally. v) Specialists from the RBGE have produced a bi-lingual, three volume field guide to the Dipterocarpaceae of South East Asia. This was complemented by a CD-ROM version</p>

7. Has your organisation received funding under the initiative before? If so, please give details.

<p>Yes. Since 1995 five projects have been awarded funding from the Darwin Initiative. These include: The Senda Darwin Forest Conservation and Training Project in Chile (1996–1998); <i>Lobarion</i> lichens as indicators of primeval forests in Carpathians, Ukraine (1997-2000); Biodiversity Inventory of the Socotra Archipelago (1997-2000); Mauritius Rare Fern Project (1996-1997); The conservation of Rhododendrons in SW China (1994-1997).</p>

8. Which overseas institutions, if any, will be involved in the project? Please explain the responsibilities of these institutions.

<p>Central Forest Seed Company, Director - Nguyen Duong Tai. The principal collaborators in Viet Nam will be the Director of the Central Forest Seed Company and his regional associates. This state owned enterprise is responsible for the national dissemination of plant material to reforestation, rehabilitation and enrichment programmes throughout the country. It has six regional offices throughout Viet Nam (see map attached to Dr Tai's CV) and staff familiar with the growing conditions in each area. Collaboration with the Central Forest Seed Company will ensure that all benefits and techniques developed will be made available across the whole country rather than to one institute or in one region. Other collaborators who will contribute and attend workshops are Prof. Dr. Vu Van Vu, Director of the Biological Faculty of Hanoi University and Dr. Le Ba Dung, Biological Faculty of Dalat University, representatives of the Vietnam-Finalnd Forestry Sector Co-operation Programme and Social Forestry Support Programme which is affiliated to the four forestry faculties of Thai Nguyen, Hue, Tay Nguyen and Thu Duc Universities of Forestry and Agriculture.</p>
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Project details

9. Define the purpose (main objective) of the project in line with the logical framework.

To provide Vietnamese researchers and field staff with the knowledge and skills to enable them to undertake the sustainable management of the remaining montane forests through an integrated programme of training in theoretical and practical aspects of biodiversity assessment and utilisation. This will result in the utilisation of elements of the biodiversity for the promotion of sustainable management by local communities and other stakeholders. The methods and techniques learnt will be applicable to other groups and the trained personnel will be able to teach others

This will be achieved by :

- 1) training in the accurate identification of threatened conifer taxa and their associated mycorrhiza
- 2) assessment of the conservation status according to the current IUCN guidelines and in line with the recommendations of the recently published Conifer Action Plan (IUCN, 1999)
- 3) assessment of potentially economically useful threatened conifer taxa and their associated mycorrhiza
- 4) development of appropriate methods for their propagation and utilisation within reforestation and rehabilitation projects in montane forests

10. Is this a new project or the continuation of an existing one?

This is a new project but stems from the EU funded interdisciplinary project aimed at restoration of the denuded areas of Cat Tien National Park. The success of this project prompted the Director of the Central Forest Seed Company to invite staff of Centre for Ecology and Hydrology (CEH) and Royal Botanic Garden Edinburgh (RBGE) to combine their expertise for a project focussing on the montane forests. Mr Ingemar Salle, Forest Manager and Conservation Specialist of the Co Bang – Bac Can Rural Development Project (EU-funded), concurred with Dr Tai's opinion that there is a real need for this training in the country at the moment.

11. What is the evidence for a demand or need for the work? How is the project related to conservation priorities in the host country(ies)? How would the project assist the host country with its obligations under the biodiversity convention?

How was the work identified?

Dr Tai and his colleagues identified the need for technical assistance to help preserve and conserve their natural montane forest. They have commenced a limited programme involving two threatened species, *Taxus wallichiana* and *Keteleeria davidiana*. Both taxa have economic potential which could be used to provide a model for other conservation programmes. However, due to the lack of expertise and funding this project has made limited progress. During a recent visit Dr Dick (CEH) met with the Director of Lam Dong Forestry Development Department of the Ministry of Agriculture, Mr Cat Quoc Khanh, who requested technical assistance to help conserve important forest resources on a wider scale for Lam Dong province. Their preferred method for achieving this is to increase the value of the products that can be sustainably harvested, such as timber, resin and edible mushrooms. Currently the indigenous people are paid the equivalent of \$3.4 per ha. per annum to protect the forests in the water-catchment area, unfortunately this limited funding means that many of the trees are felled for additional income. Our Vietnamese colleagues feel that by adding value to the existing trees e.g. for taxol and resin production and promoting planting of others trees to enhance the production of edible mushrooms, indigenous people will be less inclined to fell trees. Following contact with other development projects in the region (Mr Ingemar Salle, Forestry Manager and Conservation Specialist of the Co Bang- Bac Can Rural Development Project (EU funded), Dr Goran Axberg of the Vietnam Finland Forestry Sector Co-operation Programme and Mr Bardolf Paul of the Social Forestry Support Programme) it was clear that the work put forward in this proposal was new and would be welcomed by other related projects

How is the project related to conservation priorities in the host country?

The Vietnamese government has been concerned with biodiversity issues for many years. In 1995 the Prime Minister approved a Biodiversity National Action Plan for Viet Nam (decision no. 845/TTg) which prioritises research and work on the montane evergreen and mixed coniferous forests and the areas around them. The government recently approved the 5 million ha. reforestation programme (decision no. 661/QD-TTg) which states that the government will encourage the planting of 80,000 ha. of special use forest, which includes the montane forests that are vitally important watch catchment areas. The serious flooding over the last two years is known to be as a direct result of deforestation of the montane areas.

How will the project assist the host country meet its obligations under the Biodiversity Convention?

- i) capacity building of key institutions who are undertaking research into the sustainable management of threatened ecosystems and the planting of 'special use' forests (Articles 6/7/10; see also Annex 1 emphasising cultivated/domesticated species and relatives);
- ii) to assist in the development of conservation and sustainable use strategies by government agencies and NGOs for threatened species as well as for threatened ecosystems (Articles 6/7/8/9); iii) surveys of threatened taxa (Articles 7/8/9); iv) training of local personnel through scientific and technical collaboration (Articles 12/18).

12 In what ways can this project be considered a Darwin project? How does the project relate to the Darwin principles? How would the project be advertised as a Darwin project and in what ways would the Darwin name and logo be used?

This project can be considered as a Darwin project as it :

i) directly seeks to safeguard and enhance the biodiversity of montane forests of Viet Nam by drawing on British strengths in this area to assist a country that is rich in biodiversity but poor in financial resources; ii) encourages rehabilitation of the impoverished montane forests by promoting income generation of the indigenous peoples through added value forest products such as mushroom crops, resin and timber; iii) involves key national and local institutions as well as indigenous peoples; iv) will have a lasting impact on the capacity of the recipient country to meet its obligations under the biodiversity convention.

The personnel who will be involved are highly qualified British and Vietnamese experts. Their knowledge and expertise through training will be shared with that of the local communities. The Darwin logo will appear on all publications as well as the website. The publications will also act as an advertisement for the Darwin Initiative

13. Set out the proposed timetable for the work, including the programme's measurable outputs using the attached list of output measures.

Year 1& Year 2. Aim: to a) survey the diversity and distribution of threatened conifers and their associated mycorrhizal fungi present within montane forests in north and south-east Viet Nam and b) commence the development and transfer of techniques for rehabilitation and enrichment of those forests and the surrounding areas

Survey the diversity and distribution of threatened conifers

Annual training on conifer identification and conservation assessment involving foresters, seed collectors and botanists. This will be combined with survey work on threatened taxa, recording the diversity and distribution of threatened species such as Keteleeria , Glyptostrobus, Abies, Pinus, Taxus and Amentotaxus . The total time will be four weeks per annum. **Training Output: 4A, 7 people involved; 4B, 4 x 7= 42 training weeks per annum. Research Output: 8, 4 weeks x 2 people = 8 weeks per annum; 11B, one paper written on the status of threatened conifers of Viet Nam**

Collection of herbarium voucher specimens, the top set to be deposited in Hanoi National Herbarium and a duplicate set at the Royal Botanic Garden Edinburgh. **Research Output: 13B, 1 per annum**

Annual training of graduate students in herbarium curation and taxonomy techniques at Royal Botanic Garden, Edinburgh. **Research Output : 4B, 4 weeks. 4C, 2 people per annum**

Commence production of an illustrated field guide on the threatened conifers of Viet Nam

Survey the diversity and distribution of soil mycorrhizal fungi associated with threatened conifers

Collect root samples from threatened conifer species identified by conifer survey. Microscopically characterise the mycorrhizal diversity associated with threatened conifers. Compare the mycorrhizal diversity of threatened conifers with those found on the roots of these species growing in their natural, undisturbed habitat. Collect fruit-bodies produced by mycorrhizal fungi to aid in the latter's identification. To establish, together with local Vietnamese communities via observations in natural habitats, the range of edible fungi still being formed and those that have been lost. **Training Output: 4A, 10 people; 4B, 2 x 10= 20 training weeks per annum. Research Output: 8, 2 weeks x 1 person = 2 weeks per annum.**

Establish collections of mycorrhizal and fruitbody in herbaria as a resource and reference collection for local foresters and scientists. **Research Output: 13A, 1 per annum**

Workshop of one-week per annum on site and in the University of Hanoi to give training on identification, conservation, reintroduction techniques and exchange of ideas on mycorrhizal ecology, especially with respect to those mushrooms eaten by Vietnamese communities. **Training Output: The total time will be 5 days. 4A: 15 people, 4B: 1x15 = 15 training weeks per annum**

Commence production of an illustrated booklet on the mycorrhizal diversity of threatened conifers, to include an account of their fruitbodies, and those that are edible.

Development and transfer of techniques for rehabilitation and enrichment of Montane forests

Workshop of one-week duration giving training on plant propagation including field trials, on an exchange basis with Vietnamese nurserymen and scientists, covering both sexual and asexual methods. **Training Output: The total time will be 5 days. 4A: 10 people, 4B: 1x15 = 15 training weeks per annum 4C, 5 graduates**

Publication Commence writing a nursery booklet containing, in a simple pictorial form with Vietnamese and English text, the plant propagation techniques developed by CEH and local staff together with those techniques already being successfully practised by the Vietnamese.

In collaboration with colleagues from Vietnam and Strathclyde University develop proposal with commercial firms to select specific trees to propagate for uses such as resin production (including Taxol) and edible mushrooms

Year 3 *Aim:* to collate data collected during previous two years, discuss findings with Vietnamese counterparts, and disseminate project's outputs to relevant international organisations including forestry organisations, university departments and local Vietnamese communities

Final seminar organised by Central Forest Seed Company to disseminate the programmes findings and discuss plans with the Central Forest Seed Company, forestry organisations, university departments and local Vietnamese communities for regeneration of threatened conifers and the re-introduction of mycorrhizal fungi, particularly those known to produce edible mushrooms.

Dissemination Output 14A 1

Production of illustrated booklets on the taxonomy of threatened conifers and their mycorrhizal flora, to include, together with local information, an illustrated account of the edible mushroom component of the latter. **Research output: 10 :2 field guides**

Printing by Central Forest Seed Company of dual language information booklet demonstrating CEH and traditional methods of tree propagation. **Research output: 10 :1 manual**

Report on conservation status of conifer taxa for IUCN Conifer Specialist Group **Research output: 9 : 4 taxa**

Writing of final report

Submission of papers to peer reviewed journals **Research output: 11B : 2 (depending on results of research)**

14. Do you know of any other individual/organisation carrying out similar work? Give the details of the work, explaining the similarities and differences.

To our knowledge there is no other project looking to preserve, rehabilitate and utilise the montane forests of Viet Nam. The Indochina Tree Seed Programme, a Danida funded project, is currently working with the Central Forest Seed Company but focussing only on seed supply problems. They have told Dr Dick that they welcome the opportunity to enhance the propagation skills of the Vietnamese, as this will be of great value to all aspects of plant supply in Viet Nam. The EU, Finnish and Swiss aid projects mentioned earlier all aim to encourage sustainable use of Vietnamese forests but welcome this proposal which they feel will complement and strengthen their projects.

15. Will the project include training and development? Please indicate how many trainees will be involved, from which countries and what will be the criteria for selection. How will you measure the effectiveness of the training and will those trained then be able to train others? Where appropriate give the length of any training course.

Exchange of techniques and ideas is a key element of this project involving both UK experts travelling to teach in Viet Nam and Vietnamese staff travelling to the UK for in depth specialised training. The in-country training sessions will be held in the form of workshops in the Forest Seed Enterprises with informal practical demonstrations carried out at appropriate sites. The training will be for university personnel, local Forest Seed Enterprise staff including local indigenous technical specialists invited by our Vietnamese partners. In all about 30 people will be involved. Two to four staff will travel to the UK for specialised training. All the trainees will be able to train other people.

16. How will trainee outcomes/destinations be monitored after the end of the training?

Three field visits will allow monitoring of the people trained and allow problems to be identified and discussed. It is the practical nature of the training which lends itself to clear appraisal. The work done by the trainees after the UK specialists leave the country will be reassessed upon their return for the next training stage.

17. How is the work of the project expected to continue after the end of grant period? A clear exit strategy must be included.

As the seminar/ workshop approach is aimed at the university personnel and field specialist exchanging techniques with the UK specialists, the project will continue in two directions. The university staff will incorporate the knowledge gained into their teachings and the local field technicians will teach these techniques to members of their staff continuing the work of improving propagation techniques. At a national level, the Vietnamese government will continue with the strategy of rehabilitating montane forests in line with their Biodiversity Action Plan and their reforestation plans. In addition, a proposal will be developed for a commercial company to fund the commercialisation/domestication of specific trees for products such as resin, Taxol and edible mushrooms.

Monitoring and evaluation

18. Describe how progress on the project would be monitored and evaluated in terms of achieving its aims and objectives, both during the lifetime of the project and at its conclusion. How would you ensure that it achieves value for money? What arrangements will be made for disseminating results? If applicable, how would you seek the views of clients/customers?

A series of field exchanges between Vietnamese and the UK will ensure that staff of both countries monitor the progress made during the project. As local staff will be involved as co-researchers their views will be involved at all stages of the project during and after it. The arrangements for disseminating results will use written verbal and practical demonstrations that will leave collective memory as well as tangible field guides, manuals and demonstration plots. Progress reports will be submitted after each field trip and the necessary reports submitted to DETR. Financial monitoring will be via RBGE Finance Division.

19. Logical framework. Please enter the details of your project onto the matrix using the note at annex b of the guidance note.

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal</p> <p>To assist countries that are rich in biodiversity but poor in resources with the conservation of biological diversity and the implementation of the Biodiversity Convention</p>			

<p>Purpose To provide Vietnamese researchers and field staff with the knowledge and skills to enable them to undertake the sustainable management of the remaining montane forests through an integrated programme of training in theoretical and practical aspects of biodiversity assessment and utilisation.</p>	<p>1. Development of a publication identifying the long-term conservation status of the montane forests of Viet Nam based on the initial assessment</p> <p>2. Twenty seven Vietnamese scientists, foresters, nurserymen trained in and able to display the knowledge and skills necessary to rehabilitate and sustainably manage the threatened conifer component of the montane forests of Viet Nam</p> <p>3. Production of publications and manuals containing data-sets, assessments and the technology amassed by UK and Vietnamese project staff for wide dissemination to Vietnamese foresters/ organisations</p>	<p>Workshops</p> <p>Reports of Workshops</p> <p>Illustrated training field guides/manuals given to each Vietnamese person attending workshops</p> <p>Annual visits by UK experts</p> <p>Oral presentations by Vietnamese personnel</p> <p>Data collected and assessed by Vietnamese personnel and discussed with UK experts during visits</p> <p>Final Report</p>	<p>Able to visit montane forests to undertake observations, make assessments and provide training</p>
<p>Outputs</p> <p>1. Assessment of the conservation status of the montane forests of Viet Nam and establishment of a long term monitoring framework</p> <p>2. Capacity building for conservation, sustainable exploitation and restoration of the montane forests of Viet Nam</p> <p>3. Joint application with a commercial company for commercial development of non timber forest products e.g. taxol, mushrooms</p>	<p>1. Vietnamese personnel able to assess and monitor the long term conservation status of the montane forests of Viet Nam</p> <p>2. Twenty seven Vietnamese personnel able to utilise the information/ technology transferred during workshops and seminars organised by UK experts for sustainably managing montane forests of Viet Nam</p> <p>3. Development of a collaborative link and joint application with a commercial company for commercial development of non timber forest products e.g. taxol, mushrooms</p>	<p>Annual visits by UK experts</p> <p>Oral presentations by Vietnamese personnel</p> <p>Final seminar</p> <p>Submission of papers</p> <p>Submission of joint application with commercial company</p> <p>Final Report</p>	<p>Able to visit montane forests to make assessments and provide training</p>

<p>Activities</p> <p>1. Monitoring of threatened conifer taxa and their associated mycorrhizal fungi</p> <p>2. Establishment and maintenance of compact mycological herbaria containing reference collections of named mycorrhizal fungi and the associated hosts</p> <p>3. Assessment of the conservation status according to the current IUCN guidelines and in line with the recommendations of the recently published Conifer Action Plan (IUCN, 1999) and the Biodiversity Action Plan for Viet Nam (Hanoi 1994)</p> <p>4. Assessment dissemination and uptake of conservation priorities and strategies for the montane forests</p> <p>5. Assessment dissemination and uptake of options for sustainable and participative small scale exploitation by local communities</p> <p>6. Assessment and uptake of sustainable exploitation of non timber forest products with a commercial company e.g. Taxol, mushrooms</p> <p>7. Assessment dissemination and uptake of options for restoration of degraded areas through the development of appropriate methods of plant propagation</p>	<p>1. Recording and creating a data base of occurrence and diversity of threatened conifer taxa and their associated fungi at selected sites</p> <p>2. Deposition of reference collections of named mycorrhizal specimens and fruitbodies together with specimens of the associated threatened conifer taxa,</p> <p>3. Publication identifying the conservation status of threatened conifers and their associated mycorrhizal flora</p> <p>4. Evaluation of conservation strategy applicable to the montane forests of Viet Nam</p> <p>5. Development of a strategy for sustainable and participative small scale exploitation by local communities (especially edible mushrooms)</p> <p>6. Development of a joint application with a commercial company for commercial development of non timber forest products</p> <p>7. Development of propagation technology for restoring threatened conifer taxa to montane forests</p>	<p>Publications</p> <p>Web Page</p> <p>Reference collections of named mycorrhizal specimens and fruitbodies deposited in herbaria together with specimens of the associated threatened conifer taxa,</p> <p>Database of trees sampled and assessed for their mycorrhizal fungi (on Web Page)</p> <p>List of conifer taxa sampled (on Web Page)</p> <p>List of mycorrhizal fungi identified (on Web Page)</p> <p>List of edible fungi recorded (on Web Page)</p> <p>Propagation methods appropriate to each conifer taxa placed on Web Page and in Final Report</p> <p>Stocks of threatened conifers established in Central Forest Seed Company Nurseries</p> <p>Submission of joint application with commercial company</p> <p>Final Report.</p>	<p>Able to visit montane forests to undertake field work</p> <p>Suitable climatic conditions for general plant growth and the production of the appropriate material e.g. Fruitbodies formed by mycorrhizal fungi during life of project</p>
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